

Amendment and Response

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Serial No.: 09/776,470

Confirmation No.: 7145

Filed: February 2, 2001

For: DETECTION SYSTEM AND METHOD USING THERMAL IMAGE ANALYSIS**Remarks**

The Office Action mailed March 16, 2004 has been received and reviewed. Claims 1-2, 4-8, 11, 14-16, and 18 have been amended. Claims 3 and 13 have been cancelled. Therefore, the pending claims in the present application are claims 1-2, 4-12, and 14-20. Reconsideration and withdrawal of the rejections are respectfully requested in view of the above amendments and the accompanying remarks.

Claim Amendments

Claims 1 and 11 were amended to include the limitation that the thermal image data comprises thermal image data of at least a periorbital region of an eye of the person.

Claims 2, 5-7, and 15-16 have been amended to correct language and dependency of such claims.

Claims 4 and 14 have been amended such that they indicate that a change is detected, over a plurality of frames, in the thermal image data when the person is experiencing anxiety.

Claims 8 and 18 have been amended such that the thermal image data includes both mid-infrared thermal image data of the at least one region of the face and far-infrared thermal image data of the least one region of the face.

The 35 U.S.C. §102 Rejection

The Examiner rejected claims 1-4, 7-8 and 10 under 35 U.S.C. §102(b) as being anticipated by Tessel (WO 98/08431). Applicants respectfully traverse this rejection. However, to move the application forward to issuance, Applicants have amended the claims to include the limitation that the thermal image data includes thermal image data of at least a periorbital region of an eye of the person.

For a claim to be anticipated under 35 U.S.C. § 102(b), each and every element of the claim must be found in a single prior art reference. *See* M.P.E.P. § 2131.

With respect to claim 3, this claim has been cancelled. Therefore, the rejection with respect thereto is moot.

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With respect to claim 1, a method to detect a physiological state of a person is described. The method includes providing thermal image data of at least a region of a face of a person, wherein the thermal image data includes thermal image data of at least a periorbital region of an eye of the person. The thermal image data is then used to determine a physiological state of the person.

Tessal does not describe providing thermal image data of at least a periorbital region of an eye of the person. This is acknowledged by the Examiner on page 3, paragraph 4 of the pending Office Action. Therefore, for at least the above reason, claim 1 is not anticipated by Tessal.

Further, the remainder of the rejected claims (i.e., claims 2, 4, 7-8, and 10) depend on independent claim 1, either directly or indirectly. Therefore, they include the limitations of independent claim 1. As such, these claims are also not anticipated by Tessal for the same reasons as provided above and by reason of their own limitations. For example, claim 4 includes the limitation that a change is detected, over a plurality of frames, in the thermal image data (i.e., thermal image data of the periorbital region) when the person is experiencing anxiety. Further, for example, claim 8 has been amended such that the thermal image data includes both mid-infrared thermal image data of the at least one region of the face and far-infrared thermal image data of the least one region of the face. Such limitations are not suggested or taught in Tessal.

The 35 U.S.C. §103 Rejection

The Examiner rejected claims 5-6 and 9 under 35 U.S.C. §103(a) as being unpatentable over Tessal (WO 98/08431). The Examiner indicates that Tessal discloses the invention as described in claim 5 except that Tessal "fails to explicitly disclose the periorbital region proximate the eye." However, the Examiner indicates that "as suggested in the page 4, lines 29-35, any other symmetrical located regions on the face can be use to attain the invention as described in the reference. And, the set of eyes are the symmetrically located on the face of the eye. Therefore, it would have been obvious to one ordinary skilled in the art at the time of invention to simply work on the suggestion of the Tessal in order to come up with a thermal

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detection of the physiological state of the person." Applicants respectfully traverse this rejection:

As indicated above, Applicants have amended the claims to move the application forward to issuance. In doing so, the independent claims have been amended to include the limitation that the thermal image data includes thermal image data of at least a periorbital region of an eye of the person. Therefore, the following remarks are not only provided with respect to claim 5, but also with respect to independent claim 1, as well as the claims which depend either directly or indirectly therefrom.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art references must teach or suggest all the claim limitations. *See* M.P.E.P. § 2143.

Claim 1, and also claim 5, include the limitation that the thermal image data includes thermal image data of at least a periorbital region of an eye of the person. The thermal image data (i.e., thermal image data of at least a periorbital region) is then used to determine a physiological state of the person. For at least the reasons set forth below, claim 1 (and thus, claim 5) is not obvious in view of Tessal.

Tessal does not teach or suggest all the claim limitations. There is no teaching or suggestion of the provision of thermal image data of at least a periorbital region for use in determining a physiological state of a person. Tessal primarily describes the use of asymmetrical temperature changes of the left and right forehead as described throughout Tessal, for example, on page 4, lines 26-36. Further, as noted by the Examiner, Tessal attempts to extend such description to "other symmetrically located skin portions, such as ears and cheeks, which also exhibit this phenomenon." The Examiner acknowledges that Tessal does not explicitly describe thermal image data of the periorbital region, but relies on the language noted above to allege that the present invention is obvious in view of Tessal. In other words, it would

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appear that the Examiner believes the claim limitation of thermal image data of the periorbital region is inherent in Tessal (i.e., it is not explicitly described therein).

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. *See* M.P.E.P. § 2112. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" *In re Robertson*, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). In this case, inherency of the provision of thermal image data of at least a periorbital region cannot be established based on Tessal.

It appears that the Examiner is alleging that the provision of thermal image data of at least a periorbital region for use in determining a physiological state of a person is inherent in the language of Tessal that describes the use of asymmetrical temperature changes of the left and right forehead, and the language in Tessal (i.e., at page 4, lines 26-36) that extends such description to "other symmetrically located skin portions, such as ears and cheeks, which also exhibit this phenomenon." However, the provision of thermal image data of at least a periorbital region is not necessarily present in the language "other symmetrically located skin portions, such as ears and cheeks, which also exhibit this phenomenon."

There is nothing but a mere probability that the periorbital region of the eye would exhibit the phenomenon of asymmetrical temperature changes like that of the left and right forehead. The mere fact that such phenomenon may result when experimenting with the periorbital region is not sufficient to establish that "other symmetrically located skin portions, such as ears and cheeks, which also exhibit this phenomenon" would include the periorbital region. As such, inherency of the provision of thermal image data of at least a periorbital region cannot be established based on Tessal.

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As the Examiner acknowledges that Tessal does not explicitly describe thermal image data of the periorbital region, and such a limitation is not inherent in Tessal, Tessal fails to teach or suggest all the claim limitations. As such, claims 1 and 5 are not obvious in view of Tessal.

Further, the remainder of the rejected and pending claims (i.e., claims 2, 4, and 6-10) depend on independent claim 1, either directly or indirectly. Therefore, they include the limitations of independent claim 1. As such, these claims are also not obvious in view of Tessal for the same reasons as described above.

Claims 11-20

The Examiner further rejected claims 11-20 for the same reasons as set forth in the rejection of claims 1-10, because claims 11-20 are system claims for the method claims of claims 1-10. Applicant respectfully traverses such rejections and submits that the above amendments with respect to claims 11-20 (including the cancellation of claim 13) and remarks provided with respect to claims 1-10 are sufficient to overcome this rejection.

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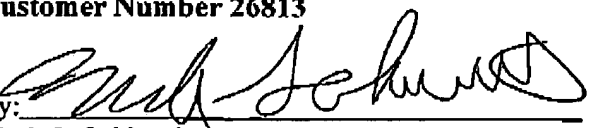
For: DETECTION SYSTEM AND METHOD USING THERMAL IMAGE ANALYSIS**Summary**

It is respectfully submitted that the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
PAVLIDIS et al.

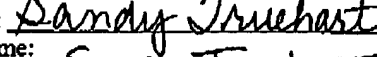
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CERTIFICATE UNDER 37 CFR §1.8:

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 12 day of July, 2004, at 2:43 pm (Central Time).

By: 
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